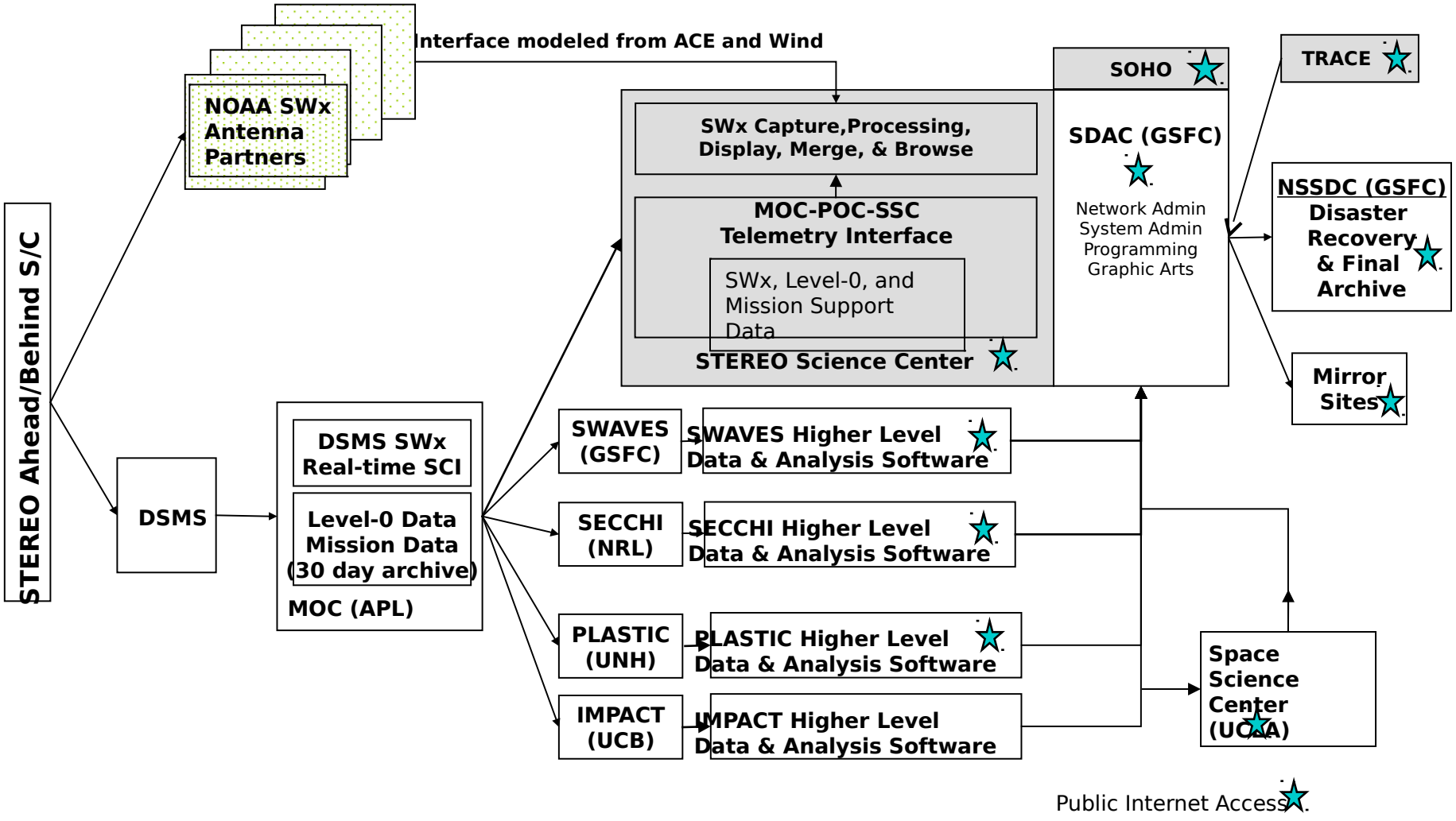
Space Weather Beacon

William Thompson

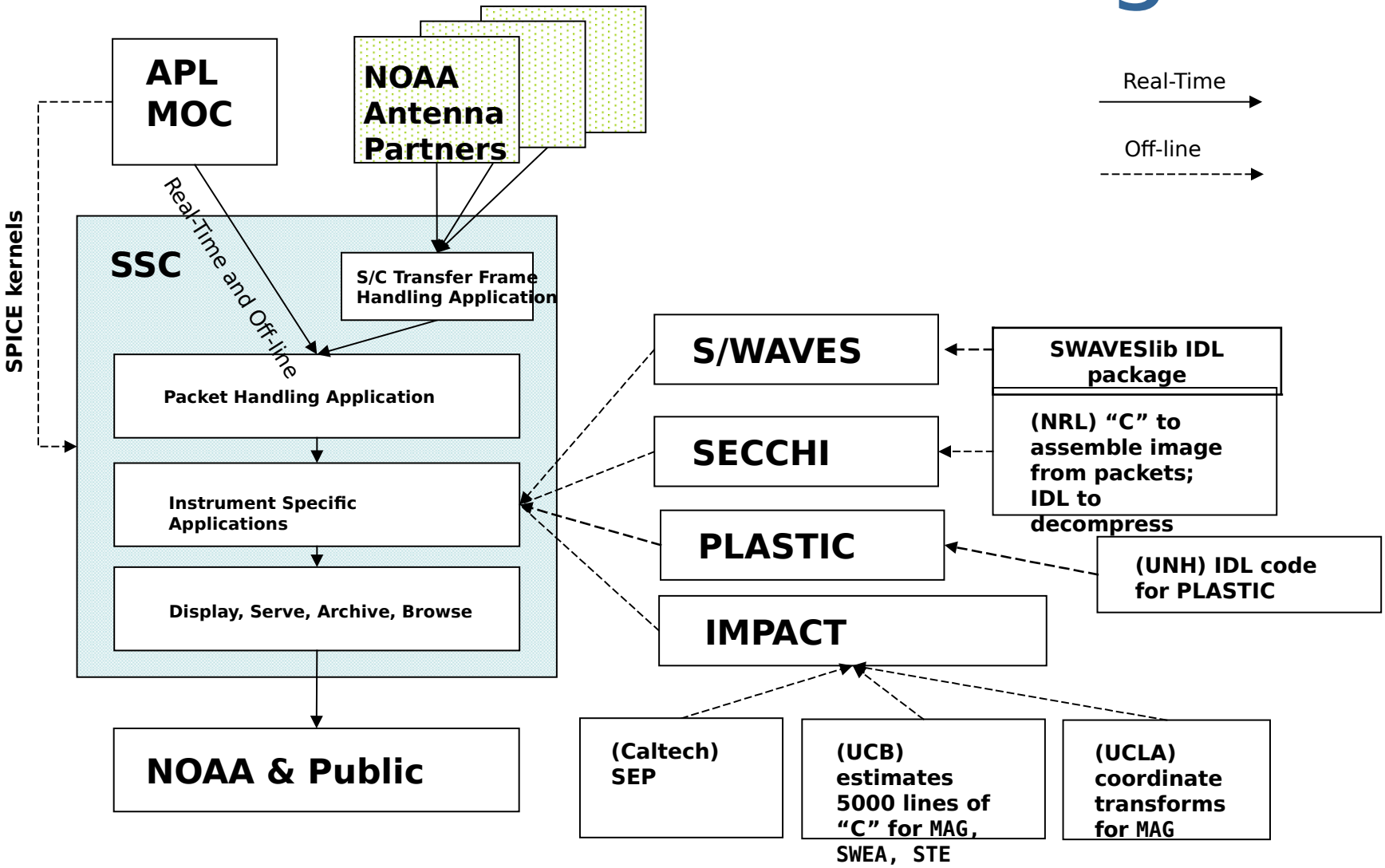
SECCHI Consortium Meeting

April 2004

Data Flow/SSC Block Diagram



Space Weather Beacon Processing



Nominal space weather beacon telemetry allocation

Instrument	Packets / minute
IMPACT	1
PLASTIC	1
S/WAVES	1
SECCHI	11.5

IMPACT (1/3)

- General: Status
- MAG: B vectors, 3 samples/minute
- STE: Electron flux in 2 look directions at 8 energies, 16 samples/minute
- SWEA:
  - Moments (electron density, bulk velocity, temp.), 13 samples/minute
  - Pitch angle distributions at 2 energies in 12 directions, 24 per minute
- SEP: All parameters are 1 minute averages
  - SEPT:
    - Electron flux at 2 energies in 4 look directions
    - Electron flux at 2 energies, summed over 4 look directions
    - Ion flux at 2 energies in 4 look directions
    - Ion flux at 2 energies summed over 4 look directions

IMPACT (2/3)

- SEP (continued): All parameters are 1 minute averages
  - LET:
    - Proton flux at 1 energy in 2 look directions
    - Proton flux at 1 energy summed over all look angles
    - He flux at 2 energies in 2 look directions
    - He flux at 1 energy summed over all look angles
    - 3He flux at 2 energies summed over all look angles
    - CNO flux at 3 energies summed over all look angles
    - Fe flux at 4 energies summed over all look angles
    - Livetime counter
    - H/He efficiency
    - Z efficiency
    - L1A-th
    - L1B-th
    - L2L2th

IMPACT (3/3)

- SEP (continued): All parameters are 1 minute averages
  - HET:
    - Electron flux at 1 energy
    - Proton flux at 3 energies
    - He flux at 3 energies
    - CNO flux at 2 energies
    - Fe flux at 1 energy
    - Livetime counter
    - Stop efficiency
    - Penetration efficiency
    - HET status
  - SIT:
    - He flux at 4 energies
    - CNO flux at 4 energies
    - Fe flux at 4 energies

PLASTIC

Parameter	Resol. (min)	Items	Bits	Total bytes/min	Source	Additional Processing
SW H density	1	1	2	2	Moments	None
SW bulk H vel. (vx,vy,vz)	1	3	16	6	Moments	None
SW H+ temp. tensor	1	6	16	12	Moments	None
SW He++ heat flux tensor	1	125	8	125	Moments	None
SW He++ peak distribution	1	1	8	1	He++ Peak	Choose center 5-energy x 5 position x 5 defl matrix from alpha distribution
SW He++ energy step	1	1	8	1	He++ Peak	Info from header
SW He++ peak deflection step	1	1	8	1	He++ Peak	Info from header
SW He++ peak position	1	1	8	1	He++ Peak	Info from header
Representative SW Charge states	5	5	8	1	SW Z>2	Summing selected bins from SW Z>2 matrix rates
Suprathermal rates	5	30	8	6	WAP_SSD_TCR WAP_SSD_CDR	Summing selected bins from Suprathermal matrix rates
PAC Value	1	1	16	2	HK	None
MCP Value	1	1	16	2	HK	None
Total bytes/min				171		

S/WAVES

- 1 minute averages for 8 channels per octave from 16 kHz – 16 MHz

SECCHI

- Able to downlink about seven 256×256 images per hour
- COR2 images every 15 minutes
- H11 and HI2 every other hour
- 4 byte sum of EUVI total intensity. This can be used to generate the EUV total flux, such as E10.7.
- Onboard CME flag. This can be used as an alert to the operator.